WHAT IS CLAIMED IS:

1. A voltage booster comprising:

a plurality of first diodes connected to each other in series between a voltage input terminal and a voltage output terminal with polarities of the first diodes oriented in the same direction;

a plurality of capacitors with one terminal of each of the capacitors connected to a junction point between any two successive ones of the first diodes;

a driving circuit for supplying a first voltage and a second voltage as alternating voltages to the other terminal of each of the capacitors alternately, the driving circuit exhibiting a driving performance to generate a voltage at least equal to a predetermined voltage at the voltage output terminal even for a predetermined minimum input voltage supplied to the voltage input terminal with a predetermined load connected to the voltage output terminal;

a voltage detection circuit for detecting a voltage supplied to the voltage input terminal; and

a driving performance adjustment means for reducing the driving performance of the driving circuit by such a reduction quantity that, the greater a magnitude of the detected voltage, the greater the reduction quantity.

2. A voltage booster according to claim 1, wherein:

the driving circuit has a switching device for changing

a state of connections between the other terminals of the capacitors; and

the driving performance adjustment means is constructed to reduce a switching frequency of the switching device by such a reduction quantity that, the greater the magnitude of the detected voltage, the greater the reduction quantity.

3. A voltage booster according to claim 2, wherein the driving performance adjustment means is constructed to adjust the switching frequency step by step in accordance with the detected voltage.

4. A voltage booster according to claim 3, wherein the driving performance adjustment means is constructed to set the switching frequency at a first frequency resulting in a maximum driving performance of the driving circuit when the detected voltage is lower than a predetermined threshold level, and set the switching frequency at a second frequency lower than the first frequency when the detected voltage is higher than the predetermined threshold level.

5. A voltage booster according to claim 2, wherein the driving performance adjustment means is constructed to continuously adjust the switching frequency in accordance with the detected voltage.

6. A voltage booster according to claim 1, wherein:

the driving circuit is constructed to include FETs of the same conduction type;

the FETs are connected to each other in series between the voltage input terminal and a ground terminal to sandwich the other terminal of any of the capacitors;

the FETs are driven to operate complementarily to each other; and

one of the FETs that is connected to the voltage input terminal has its gate driven by a voltage boosted by the driving circuit itself.

7. A voltage booster according to claim 6, further comprising:

a plurality of second diodes each connected between the voltage input terminal and a common junction point between any two successive ones of the first diodes in such a way that polarities of the second diodes are oriented in the same direction as the polarities of the first diodes.

8. A voltage booster according to claim 1, wherein:

the driving circuit is constructed to include a first pair of FETs, a second pair of FETs connected in parallel with the first pair, a third pair of FETs and a fourth pair of FETs connected in parallel with the third pair;

the FETs in each pair are connected to each other in series

between the voltage input terminal and a ground terminal to sandwich the other terminal of any of the capacitors;

the FETs in each pair are driven to operate complementarily to each other; and

the driving performance adjustment means drives all of the pairs of FETs when the magnitude of the detected voltage is lower than a predetermined threshold level, and drives only one of the first and the second pair of FETs and one of the third and fourth pairs of the FETs when the magnitude of the detected voltage is greater than the predetermined threshold level.

9. A voltage booster according to claim 8, wherein the driving performance adjustment means drives the FETs of the first to the fourth pairs at the same frequency irrespective of the magnitude of the detected voltage.

10. A voltage booster according to claim 1, further comprising:

a plurality of second diodes each connected between the voltage input terminal and a common junction point between any two successive ones of the first diodes in such a way that polarities of the second diodes are oriented in the same direction as the polarities of the first diodes.

11. A voltage booster comprising:

a plurality of diodes connected to each other in series

between a voltage input terminal and a voltage output terminal with polarities of the diodes oriented in the same direction;

a plurality of capacitors with one terminal of each of the capacitors connected to a junction point between any two successive ones of the diodes;

a driving circuit for supplying a first voltage and a second voltage as alternating voltages to the other terminal of each of the capacitors alternately; and

a current regulation circuit provided in a path supplying a charging current to the capacitors.

12. A voltage booster according to claim 11, wherein the current regulation circuit is provided in a path supplying the charging current from the voltage input terminal to the diodes.

13. A voltage booster according to claim 11, wherein:

the driving circuit is constructed to receive a current from the voltage input terminal; and

the current regulation circuit is provided in a path supplying a charging current from the voltage input terminal to the driving circuit.

14. A voltage booster according to claim 11, wherein the current regulation circuit is provided for each of the diodes, which are connected to each other in series, by being connected to each of the diodes in series.

15. A voltage booster according to claim 11, wherein the current regulation circuit includes:

a first transistor provided in a path through which charging and discharging currents flow to and from the capacitors;

a second transistor forming a current mirror circuit in conjunction with the first transistor; and

a constant current generator for supplying a constant current to the second transistor.

16. A voltage booster according to claim 11, wherein the current regulation circuit includes:

a transistor provided in a path through which charging and discharging currents flow to and from the capacitors; and

a resistor connected between a base of the transistor and a reference electric potential line.

17. A voltage booster according to claim 11, wherein a magnitude Im of a controlled current output by the current regulation circuit satisfies the following condition relation:

$$Im \geq C \cdot V \cdot f$$

where notation V denotes an accumulated-charge voltage appearing in each of the capacitors, f denotes a pumping frequency at which the driving circuit replaces the first voltage by the second voltage and vice versa and, notation C

denotes a capacitance of each of the capacitors.